

Reliability, Validity and Factor Structure of Values Scale

Mubashir Gull¹, Eisha Rahman², and Akbar Husain²

¹Aligarh Muslim University, Aligarh

²Affiliation not available

April 22, 2020

Abstract

The impact our decisions cast on ourselves and others are often a resounding reflection of the core values infused in our belief system. They are the guiding principles for desirable codes of conduct and actions that modulate one's self-concept. Thus precise identification of values can unearth one's priorities and basis of functioning. However, the lack of sound and comprehensive instruments for evincing the core values of individuals in eastern countries serves as the prime motive for the present study, i.e., development of the values scale. More explicitly, the exploratory factor analysis (EFA) was run to explore the factor structure of the scale. The factor validity of 25 item scale was determined on a sample of 300 adults. Principal component analysis with Varimax rotation method yielded a seven-factor structure (Benevolence, Egalitarian, Self-direction, Social Obligation, Aspirations, Political, and Spiritual/ Religious) collectively accounting 59.48 percent of the variance. Furthermore, confirmatory factor analysis (CFA) indicated that the seven-factor solution proposed in EFA has good fit indices ($\chi^2/df = 2.11$; AGFI = .834; CFI = .851; RMSEA = .061; RMR = .026; TLI = .823). The obtained results thus supported an acceptable level of reliability, validity, and factor structure of the Values Scale.

Reliability, Validity and Factor Structure of Values Scale

Mubashir Gull*, Eisha Rahman**, and Akbar Husain***

Abstract

The impact our decisions cast on ourselves and others are often a resounding reflection of the core values infused in our belief system. They are the guiding principles for desirable codes of conduct and actions that modulate one's self-concept. Thus precise identification of values can unearth one's priorities and basis of functioning. However, the lack of sound and comprehensive instruments for evincing the core values of individuals in eastern countries serves as the prime motive for the present study, i.e., development of the values scale. More explicitly, the exploratory factor analysis (EFA) was run to explore the factor structure of the scale. The factor validity of 25 item scale was determined on a sample of 300 adults. Principal component analysis with Varimax rotation method yielded a seven-factor structure (Benevolence, Egalitarian, Self-direction, Social Obligation, Aspirations, Political, and Spiritual/ Religious) collectively accounting 59.48 percent of the variance. Furthermore, confirmatory factor analysis (CFA) indicated that the seven-factor solution proposed in EFA has good fit indices ($\chi^2/df = 2.11$; AGFI = .834; CFI = .851; RMSEA = .061; RMR = .026; TLI = .823). The obtained results thus supported an acceptable level of reliability, validity, and factor structure of the Values Scale.

Keywords: values scale, factor structure, psychometric properties, exploratory and confirmatory factor analysis.

*Postdoctoral Fellow (ICSSR), Department of Psychology, Aligarh Muslim University, Aligarh, India-202002

**Research Scholar, Department of Psychology, Aligarh Muslim University, Aligarh, India-202002

Introduction

The impact our decisions cast on ourselves, and others are often a profound reflection of the values infused in our belief system (Rohan, 2000). These values are guiding principles for desirable codes of conduct and actions that modulate one's self-concept. As a result, scholars over the millennial have remained enthralled by its profound influence on human lives. Some have described it as universal beliefs (Rokeach, 2008) about codes of conduct ideal to the given state of affairs (Kluckhohn, 1951), while others, like Feather (1975) have explored it in terms of "prescriptive" and "proscriptive" beliefs. Rokeach, (1967), have further traced it as an ingrained conviction about desirable ways of behaving.

A comprehensive theory and scale of human values must, therefore, consider values as it developed over the years. To give a clear account of how values came into the institution, we must, therefore, address questions associated with its origin, function, embodiment, inculcation, learning, forgetting, perception, and influence. The present study thus looks forward to providing an instrument that can comprehensively address the enigma of values.

Values and its Dimension

The concept of values has been extensively explored because of its comprehensive framework and eclectic role that facilitates the sustainable development of individuals. This has led to the broadening of its classification over the years. Scholars have not just divided it based on its integral role in the development and tailoring of personality (Vernon & Allport, 1931; Duke, 1955; Maslow, 1967), but based on its influence on one's behavioral preferences too (Morris, 1956; Allport, 1961; Kluckhohn, 1951). More precisely, it has been divided into the following sub-types: theoretical, economic, aesthetic, social, political, and religious (Vernon & Allport, 1931); operational values (Kluckhohn, 1951), conceived values, and object values (Morris, 1956); terminal and instrumental values based on the notion of interpersonal or intrapersonal orientation; personal, social, and moral competencies (Rokeach, 1967); and moral, ethical, and socio-political values (Sheth, 1995). In more recent times, it is being explored and bifurcated in terms of its generation that is whether they are fostered by science or not (Bronowski, 2011); still, the major part of its exploration is related to the influence of diverse life aspects in its determination.

Origin of Values

The values get imbued in our life in response to the approval and disapproval of significant others, especially parents. More specifically, they get instituted in early childhood and continue to develop and modify as we interact with our family and friends or participate in social organizations viz. educational institutions, religious shrines, or cultural groups (Rokeach, 1967). The value institution occurs because our interaction implants the seed of learning via observation, imitation, and modeling (Bandura & Walters, 1977). However, some scholars also argue that it has a neurobiological grounding (Damasio, 2005). Irrespective of this fact, these standards of right and wrong giving rise to a personal sense of worth, regret or guilt, stems from one's superego (McLeod, 2016), and are the controlling force of inappropriate and irresistible impulses.

Need and Importance of Value Exploration

"What should I do with my life?" and "What are the criteria for right?" are the questions in which most of us often engage. A sound and desirable answer to these questions can only be derived if we take values as a catalyst in guiding our course of action. These cognitive constructs delineate one's behavioral inclination in life (Renner, 2003) and give birth to personal goals. They also tend to place limits on the unreasonable means we adopt to fulfill these goals. Determining values is an essential step in the growth of the self, for they compel us to look inward and act wisely.

The values are direly vital because they influence critical areas and aspects of our life, such as family affairs, career, formation of an intimate relationship, expression of one's feelings, role portrayal, leadership, etc.,

(Maio, 2016). Thus our values must be genuine and reasonable; they must fit with the sense of self, allowing ourselves and others to thrive.

The postulation of these values is influenced by numerous aspects of an individual's life, such as the understanding of self, others, society, and culture (Rokeach, 1979), socio-economic development (Feather, 1975), and social and cultural change. At the idiosyncratic level, these values shed light on the pursuit of one's self-image, subjective, cultural, and behavioral orientations (Rokeach, 1973) along with substantially predicting one's attitudes, predispositions, preferences, and explicit behaviors. (Sagiv, Roccas, Cieciuch, & Schwartz, 2017). Since values form an integral part of the normative order of a society, thus any study related to socio-cultural development and growth must involve a careful analysis of value structure (Williams, 1979). Moreover, the complexities posed by the meteoric rise of technological advancements and globalization also underpin the importance of probing the human values (Chowdhury, 2018).

Why is there a need for a more eclectic approach to assessing value?

Attitude, interest, motive, need, sentiment, and valence are some of the terms that are used interchangeably in the psychological literature to denote the phenomenon of value. However, these terms are not the perfect or absolute incarnation of values, and there exists a slight difference between them (Schwartz, 2012). Thus attempts have been made from time to time to define and classify values comprehensively. However, the concept of value, as well as other related concepts, has eluded a universally acceptable and satisfactory definition and classification. This rudimentary knowledge may stem from the fact that values are not static; instead, they are dynamic and are subjective to the changes in the socio-cultural, economic, and political structure of the societies (Husain, 1988).

Psychologists in eastern cultures like India have thus questioned the validity of measures related to values that have been borrowed from the west (Husain, 1983), thereby igniting the need for addressing the role of cultural and psychological factors in understanding the value system. Moreover, these methodological and conceptual needs related to the arena of core human values have posited greater emphasis on the standardization of measures relevant to the cross-cultural domains of the value system (Husain, 1988); thus addressing the dire need of establishing, the crux of one's value inclination in eastern cultures.

Objectives of the Study

To explore the structure of values scale by using exploratory factor analysis and confirmatory factor analysis.

To determine the reliability and validity of the values scale.

Method

Item generation

In the process of item selection, available literature, and discussion with persons working in the field were used. Researchers first generated the items and then derived scale from the items.

Validity

Content Validity : To establish the content validity of the values scale, ten purposively chosen experts working in the field of psychology, sociology, psychometrics, and education were approached to evaluate the items. Every reviewer independently rated the relevance of each item on the values scale using a 4-point Likert rating scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant, 4 = very relevant). In light of the feedback from the experts, 13 items were considered invalid.

Face validity: To determine this type of validity, experts responded to each item in terms of the clarity of wording, layout and style, and the likelihood of the target audience. This type of validity is considered easier, but the weakest form of validity (Haladyna, 2004).

Sample

A total of 300 adults from the Aligarh Muslim University of the district Aligarh participated in this study. Adults who wilfully agreed to participate in the study were asked to read and sign the consent form. The sample comprised (153) 49% female and (147) 51% male. 55.3% (166) of the sample were pursuing Ph.D., 33.7% (101) were pursuing Post-graduation, and 11% (33) were in undergraduate courses. The participant's ages ranged from 18-35, with a mean age of 27 (SD = 3.50).

Procedure

Prior to the administration of the scale, the rapport was established with the participants. The researchers introduced themselves and explained the purpose of the research. The respondents were then assured that their responses will remain strictly confidential and will be used for research purposes only. Followed by this, participants were asked to respond to each item candidly.

Statistical Analysis

To assess the factor structure of the scale, we performed an exploratory factor analysis (PCA with Varimax rotation). Two criteria were employed in order to determine the number of factors: Kaiser Criterion with an eigenvalue greater than one, and Cattell's Scree plot. The cut-off used for factor loadings was .40 (Comrey & Lee, 1992; Stevens, 2002), and the Cronbach's alpha was employed as a measure of internal consistency.

Results

Descriptive Analysis

Table 1 presents the descriptive analysis of the Values Scale at an item level. Analysis of 25 items revealed the means, Standard deviation (SD), Skewness, Kurtosis, Item-total correlation, and Cronbach's Alpha. Skewness and Kurtosis results are in the normal range (Kline, 1998). The item-total correlation was greater than .25 for all the items, and the alpha for the 25 items was .89, and it did not become worse with the elimination of any item.

Table 1: *Values Scale: Descriptive results (N = 300)*

	Mean	SD	Skewness	Kurtosis	Item-total correlation	Alpha if item deleted
1. Accomplishment	3.48	.575	-.759	.793	.256	.897
2. Achievement	3.55	.590	-1.142	1.325	.416	.895
3. Ambitious	3.48	.651	-1.156	1.435	.347	.896
4. Diversity	3.25	.773	-.821	.198	.329	.896
5. Empowerment	3.46	.650	-1.234	2.196	.545	.893
6. Fasting	3.33	.754	-.998	.683	.496	.894
7. Forgiveness	3.57	.594	-1.348	2.241	.542	.894
8. Freedom	3.55	.530	-.553	-.982	.348	.896
9. Gentleness	3.45	.584	-.600	-.007	.656	.892
10. Helpful	3.67	.499	-1.049	-.166	.577	.894
11. Honesty	3.80	.438	-2.116	3.790	.386	.896
12. Hospitality	3.53	.598	-1.050	1.073	.557	.893
13. Human Dignity	3.72	.517	-1.999	4.851	.441	.895
14. Humility	3.19	.929	-.991	.083	.327	.896
15. Justice	3.80	.403	-1.482	.196	.384	.896
16. Liberty	3.47	.580	-.542	-.656	.421	.895
17. Obedience	3.39	.576	-.616	1.235	.467	.895
18. Plurality	2.99	.789	-.565	.072	.353	.896
19. Power	3.01	.791	-.426	-.330	.467	.894
20. Resourcefulness	3.35	.606	-.526	.369	.519	.894
21. Respect	3.69	.477	-1.010	-.508	.474	.895
22. Responsibility	3.67	.485	-.903	-.742	.470	.895

	Mean	SD	Skewness	Kurtosis	Item-total correlation	Alpha if item deleted
23. Righteousness	3.57	.571	-1.051	.721	.526	.894
24. Simplicity	3.36	.733	-.928	.348	.522	.893
25. Truth (Satyagraha)	3.64	.534	-1.243	1.350	.410	.895

Factor Structure of Values scale

In order to explore the factor structure of the values scale, PCA with Varimax rotation, Scree plot was used. The number of factors was determined on the basis of Eigen values and Scree plot (Kim & Mueller, 1978).

Initially, principal component analysis with Varimax rotation was performed to assess the 64 items values scale. The factor analysis thus emerged comprised of 20 factors with the number of items in factors ranging from 1 to 41. It was also found that most of the factors had cross-loadings; hence, due attention was paid upon those items that did not load accurately on any factor ($<.40$) or had cross-loadings on other factors (Field, 2013). Besides this, factors having items less than three and items with communalities ($<.50$) were also removed from the list. After the removal of these items, factor analysis for the remaining 25 items was run once again. The sample variance, thus recovered from the seven-factor solution, was found out to be 59.48%. Moreover, the value for Kaiser Myer Olkin (KMO) was found to be .83, which is an indicator of sampling adequacy. Besides, the Bartlett Test of Sphericity value was 2127.88 and was significant at $p < .001$.

Factor 1 had an eigenvalue of 6.11, explaining 9.91% of the variance, retaining four items with factor loading ranging from .571 to .789. This factor was named as *Benevolence*. Factor 2 had an eigenvalue of 1.94, explaining 9.75% of the variance, retaining five items with factor loading ranging from .501 to .782. This factor was named *Egalitarian*. Factor 3 had an eigenvalue of 1.65, explaining 8.85% of the variance, retaining four items with factor loading ranging from .602 to .692. This factor was named as *Self-direction*. Factor 4 had an eigenvalue of 1.56, explaining 8.46% of the variance, retaining three items with factor loading ranging from .631 to .742. This factor was named *Social Obligation*. Factor 5 had an eigenvalue of 1.33, explaining 7.99% of the variance, retaining three items with factor loading ranging from .631 to .829. This factor was named as *Aspirations*. Factor 6 had an eigenvalue of 1.18, explaining 7.54% of the variance, retaining three items with factor loading ranging from .518 to .763. This factor was named as *Political*. Factor 7 had an eigenvalue of 1.06, explaining 6.96% of the variance, retaining three items with factor loading ranging from .531 to .701. This factor was named as *Spiritual/ Religious* (Table 2).

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	
	Component F1	Component F2	Component F3	Component F4	Component F5	Component F6	Component F7	h^2
Benevolence 11. Honesty	Loadings	Loadings	Loadings					.66
	.789							
12. Hospitality	.632							.57
10. Helpfulness	.577							.54
13. Human Dignity	.571							.62
Egalitarian 08. Freedom	Loadings	Loadings	Loadings					.63
		.782						
16. Liberty		.697						.64
15. Justice		.605						.51
05. Empowerment		.534						.53
09. Gentleness		.501						.61

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>
Self- direction 22.		Loadings	Loadings	Loadings			
Responsibility 21. Respect 20.			.692				.60
Resourcefulness 23.			.638				.58
Righteousness Social Obligation 17.			.633				.56
Obedience 25. Truth- fulness (Satyagraha) 24.			.602				.60
Simplicity Aspirations 02.				Loadings	Loadings	Loadings	
Achievement					.742		.64
					.738		.65
					.631		.54
				Loadings	Loadings	Loadings	
					.829		.75

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h²) ex- plained by seven factors of values scale with Varimax rotation.</i>	
01. Accomplishment					.645		.64	
03. Ambition					.631		.56	
Political					Loadings	Loadings	Loadings	
18. Plurality						.763	.63	
04. Diversity						.589	.51	
19. Power						.518	.60	
Spiritual/ Religious				Loadings	Loadings	Loadings	Loadings	
07. Forgiveness							.701	.66
14. Humility							.666	.54
06. Fasting							.531	.51
Alpha	.74	.74	.71	.66	.60	.55	.55	
Composite	.74	.76	.74	.75	.75	.66	.67	-
Reliability								

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	
Percent of Variance	9.91	9.75	8.85	8.46	7.99	7.54	6.96	-
Cum. Percent of Variance (CPV)	9.91	19.67	28.52	36.98	44.97	52.52	59.48	-

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>
Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction	Extraction Method: Princi- pal Compo- nent Analy- sis. Rotation Method: Varimax with Kaiser Normal- ization. $h^2 =$ commu- nalities after factor extraction

Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>	Table 2: <i>Items, factor load- ings, Cron- bach's alpha, Com- posite reliabil- ity, Vari- ance ex- plained and commu- nalities (h^2) ex- plained by seven factors of values scale with Varimax rotation.</i>
a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.	a. Rota- tion con- verged in 9 iterations.

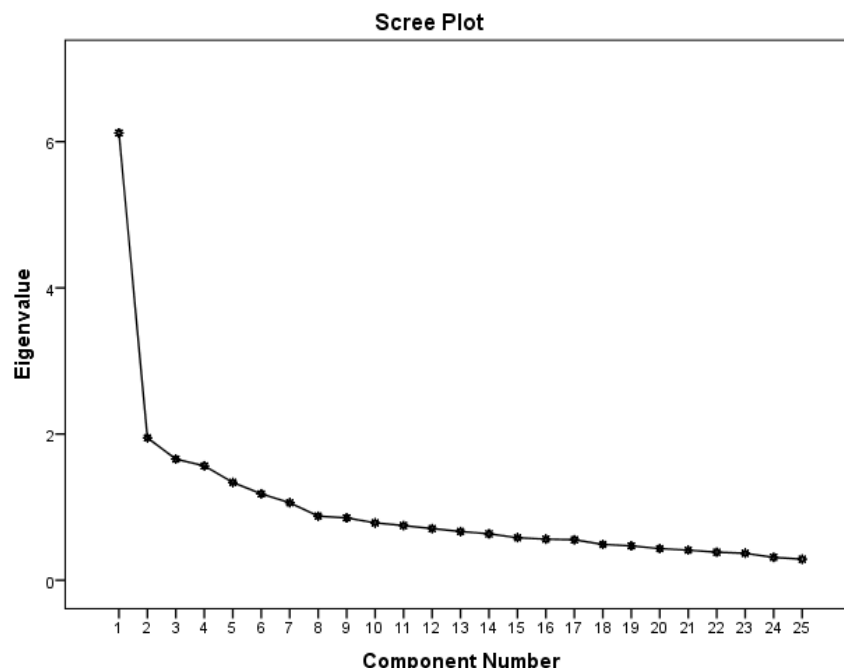


Figure 1. Scree plot for matrix of 25 items of Values Scale through PCA

Operational definitions of dimensions

Benevolence is the quality of being generous, kind, and sympathetic. It refers to the feeling of cooperation, warmth, goodwill, and sincerity towards others. Individuals who score high on benevolence are more likely than others, to be honest, hospitable, helpful, and gentle.

Egalitarianism is the belief in the equality of rights, status, and opportunities to all. It includes respect and value for all irrespective of their caste, creed, gender, etc. Also, it involves a strong emphasis on the equality of outcomes, i.e., making sure that everyone is empowered, free, and sustained to have access to resources and decision making. A high score on egalitarianism suggests that individual believes in freedom, liberty, justice, empowerment, and human dignity.

Self-direction is the ability that empowers one to regulate his/her behavior and actions. It is an essential trait in determining alignment on one's actions with his/her virtues. Being high on self-directedness enables one to take responsibilities, display respect towards others, be resourceful, and act righteously.

Social Obligation is an individual's duty towards the benefit of society and nature. It involves adherence and compliance with truth, simplicity, and laws of nature and community. In short, it refers to the display of appropriate conduct.

Aspiration is a trait referring to an individual's level of ambition. A high level of this value may suggest that the individual puts in lots of effort in getting things done. In other words, it implies goal-directed efforts put in by the individual to achieve the desired things successfully. Sometimes being too achievement-oriented may come in the way of being morally right; thus, conscience-oriented aspiration levels are the best.

Political Values are the belief about the welfare of the public. It is concerned with the ways authorities in

general, and those governing the nation should operate and exercise their power. High scores on political values imply respect for pluralism, diversity, and power.

Spiritual/ Religious Values are the composite values of one's soul consisting of humility, altruism, forgiveness, etc., which contribute to the spiritual growth of an individual. It strongly emphasizes on the abstinence of self from all kinds of evils. Also, it endorses the practice of fasting to strengthen the will power of the individual to become religiously more committed and devout.

Psychometric Properties of the Values Scale

Reliability estimates

The alpha reliability coefficient of the 25 item values scale was found to be .84, thus indicating that the scale is internally consistent and highly reliable. The reliabilities for F1, F2, F3, F4, F5, F6, and F7 were .74, .74, .71, .66, .60, .55, and .55 respectively (table 2).

Item-to-total correlation

This type of correlation was used to check whether all the items were individually correlated with the overall score of the scale. Its values ranged from .27 to .68. A statistically significant positive correlation of all items was found with the overall score of the scale (table 1).

Confirmatory factor analysis (CFA) was performed to replicate the seven-factor solution found through exploratory factor analysis. The indices which were used to test the model were (i) the ratio of chi-square to the degree of freedom, (ii) The goodness of fit index (GFI), (iii) the comparative fit index (CFI), root mean square residual (RMR) and root mean square error of approximation (RMSEA). According to (Byrne, 2016), the fit is considered acceptable/good, when the ratio of chi-square to degree of freedom ranges between 2-3, the value of GFI and CFI are close to or higher than .95, the value of RMR is equal to or lower than .08 and value of RMSEA is below .06. Following the Byrne criteria, the seven-factor solution of values scale showed good fit indices. The ratio of $\chi^2/df = 2.11$; AGFI = .834; CFI = .851; RMSEA = .061; RMR = .026; TLI = .823). These fit indices support the structural validity of the values scale (Table 3).

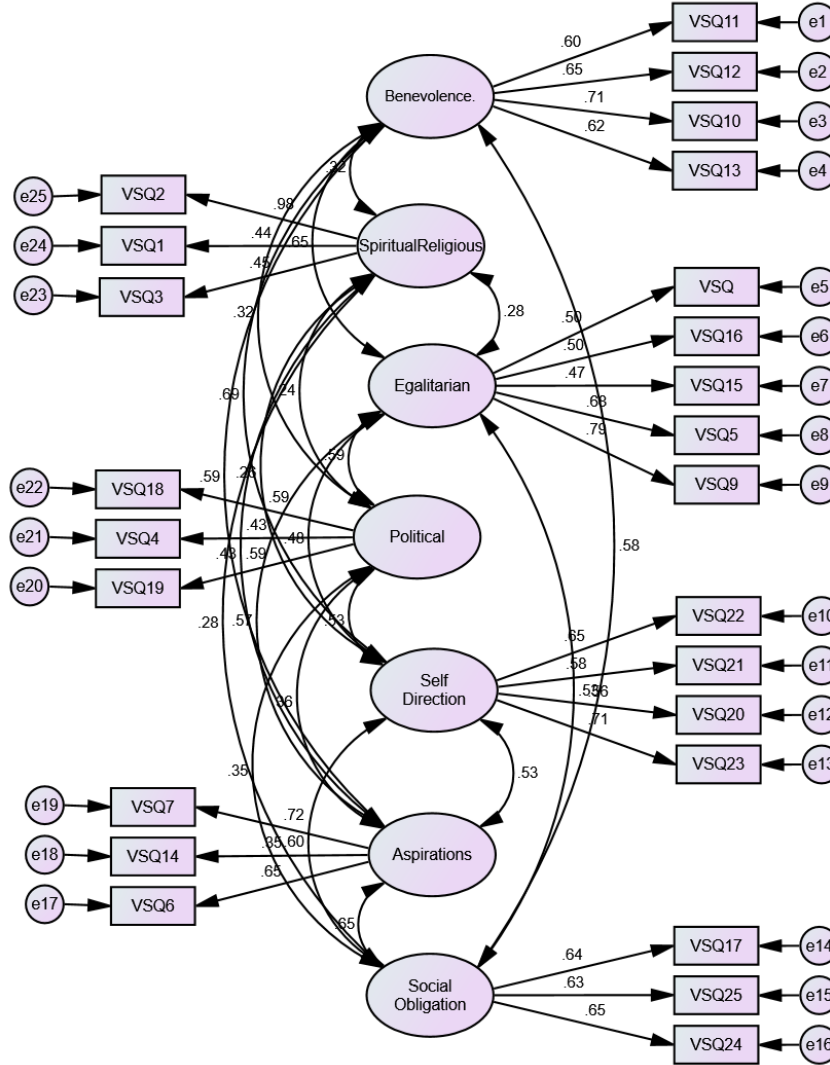


Figure 2: Measurement model of Values scale

Table 3: Confirmatory Factor Analysis of the Values Scale and Goodness-of-fit Indices

Unifactorial model of MHS	χ^2	df	χ^2 / df	CFI	AGFI	RMR	RMSEA	TLI
Model 1	536.52	254	2.11	.851	.834	.026	.061	.823

Differences on Values scale along with demographic variables

In order to find out the differences in gender, educational qualification, and age of the participants, t-test, ANOVA and correlation were respectively computed. *Cohen's d* was also calculated to see the effect size of significant mean differences.

Table 4: Mean, Standard deviation, and t-values on values scale with respect to demographic variables

($N=300$).

Demographic									
Variables	Gender	N	Mean	SD	<i>t</i>	<i>p</i>	<i>LL</i>	<i>UL</i>	<i>Co</i>
Gender	Male	147	85.69	8.16	-2.97	.003	-4.13	-.83	.34
	Female	153	88.18	6.17					
Locale	Rural	140	86.95	7.46	-.03	.97	-1.69	1.64	.00
	Urban	160	86.97	7.19					

The table revealed a statistically significant difference between males and females on the values scale. The mean score of female participants was higher than male participants indicating that females consider these values more important or critical as compared to their counterparts.

Concerning the area of locale (rural/urban), the statistically insignificant difference was found among participants. Further, to investigate the role of age in values, Pearson's correlation was performed. Results revealed a statistically significant relationship between age and values ($r = -.125$; $p < .05$), indicating that the importance of values decreases with an increase in age.

Table 5: *Correlational Matrix*

	Age	F1	F2	F3	F4	F5	F6	F7	F8
Age	1	-.048	-.051	-.022	-.097	-.022	-.134*	-.181**	-.125*
F1 Benevolence		1	.431**	.503**	.397**	.252**	.210**	.375**	.694**
F2 Egalitarian			1	.358**	.341**	.243**	.385**	.351**	.717**
F3 Self-direction				1	.422**	.278**	.357**	.356**	.717**
F4 Social Obligation					1	.232**	.221**	.397**	.648**
F5 Aspirations						1	.172**	.203**	.496**
F6 Political							1	.253**	.591**
F7 Spiritual/ Religious								1	.654**
F8 Overall Values									1

Discussion and Conclusion

Researchers over the decade have explored the factors that promote sustainable human development. One of the prime contributors amongst them has been the human values that facilitate and regulate one's attitudes and behaviors (Shepherd, Kuskova & Patzelt, 2009). This has prompted the development of countless instruments for measuring the core values of individuals. However, the fate of such instruments has been subjective to the changing nature of one's value constitution, for understanding values is a never-ending process that can most precisely be uncovered by the method of successive approximation (Rokeach, 2008). In heed of this limitation, there is a need for an eclectic scale to measure the values underlying sustainable development in recent times (Leiserowitz, Kates, & Parris 2006). Thus this study was conducted to accentuate the fundamental values that underlie sustainable human development. The resulting scale thereby looks forward to providing a comprehensive outlook and account of human values, which have remained substantially uncharted (Apasu, & Buatsi, 2015).

More specifically, this study presents the empirical procedures used in the development and standardization of values scale, an instrument designed to identify the inclination of people's interest in uprightness and collective gain over personal agenda. The notion behind this philosophy was that "the values favoring the interest of the collective over that of individual promote pro-social behaviors" (Chan, 2019).

The researchers initiated with the generation of items using a rational theoretical approach followed by factor

analysis to derive the scale. The results thus obtained through EFA confirmed the multidimensionality of the values scale, and demonstrated high reliability and internal consistency. Principal component analysis with Varimax rotation method yielded a seven-factor structure (Benevolence, Egalitarian, Self-direction, Social Obligation, Aspirations, Political, and Spiritual/ Religious) collectively accounting 59.48 percent of the variance. Furthermore, confirmatory factor analysis (CFA) indicated that the seven-factor solution proposed in EFA has good fit indices ($\chi^2/df = 2.11$; AGFI = .834; CFI = .851; RMSEA = .061; RMR = .026; TLI = .823). In a nutshell, it can be said that the values scale is an auspicious measure with good reliability, validity, and factor structure.

Hopefully, the values scale will prove to be a useful tool in unearthing the core human values underlying one's thoughts, actions, and behaviors. Besides, the scale aspires to benefit a wide range of professionals such as those working in the fields of healthcare, counseling, administration, education, and more by helping them identify the value priority of individuals. It may also help in predicting the context-specific goal orientation of individuals, as well as the motivational correlates of various goal orientations (Levontin & Bardi, 2018). More explicitly, the pro-social value of benevolence may help predict the mutual success of oneself together with others (amity goal orientation), power values may help prewise performance-approach goal orientation, self-direction values may help envisage mastery goal orientation, and security values may help spae performance-avoidance goal orientation. Moreover, the personal values of justice and equity may help in the prediction of well-being among non-native individuals (Jamaludin, Sam, Sandal, & Adam, 2016).

The use of the values scale may further boon the researchers in exploring the reasons behind inconsistencies in decision making, which is a precursor to factors affecting the lives of self and people around us. This notion stems from several pieces of research suggesting that one's ineffective and unreasonable decisions are governed by the faulty patterns of thinking and belief system (Friedman, 2004), which in turn is a reflection of our values. Thus by contemplating the core values in one's lives, individuals will be able to temporize and dictate their actions, kindle their self-concept, keep themselves grounded, so on and so forth; for these values act as a supervisory and motivating force (Toffler, 1969; Baier & Rescher, 1969) that enrich our lives and make us more humane.

References

- Allport, G. W. (1961). *Pattern and growth in personality* . New York: Holt, Rinehart & Winston
- Apasu, Y., & Buatsi, S. N. (2015). Personal Values and the Salesperson's Performance: A Theoretical Perspective. In *Proceedings of the 1983 Academy of Marketing Science (AMS) Annual Conference* (pp. 311-316). Springer, Cham.
- Baier, K., & Rescher, N. (eds.) (1969). *Values and the Future: The Impact of Technological Change on American Values* , New York: The Free Press.
- Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood Cliffs, NJ: Prentice-hall.
- Bronowski, J. (2011). *Science and human values* . Faber & Faber.
- Chan, H. W. (2019). When do values promote pro-environmental behaviors? Multilevel evidence on the self-expression hypothesis. *Journal of Environmental Psychology* , 101361.
- Chowdhury, M. (2018). Emphasizing morals, values, ethics, and character education in science education and science teaching. *MOJES: Malaysian Online Journal of Educational Sciences* , 4 (2), 1-16.
- Comrey, A. L., & Lee, H. B. (1992). Interpretation and application of factor analytic results. In: *A first course in factor analysis* , (2nd ed.) . Hillsdale, N.J: Lawrence Erlbaum Associates (pp. 250-254).
- Damasio, A. (2005). The neurobiological grounding of human values. In *Neurobiology of human values* (pp. 47-56). Springer, Berlin, Heidelberg.
- Dukes, W. F. (1955). Psychological studies of values. *Psychological Bulletin* , 52 (1), 24-50.

- Feather, N. T. (1975). *Values in education and society* . Free Press.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed., pp. 665–719). London: Sage Publications.
- Friedman, S. (2004). Learning to make more effective decisions: changing beliefs as a prelude to action. *The Learning Organization* , 11 (2), 110-128.
- Haladyna, T. M. (2004). *Developing and validating multiple-choice test items* . New Jersey: Lawrence Erlbaum.
- Husain, A. (1983). *Interpersonal Attraction: Sources and Levels of Friendship* . Varanasi: Rupa Psychological Centre.
- Husain, A. (1988). Value preferences among Indian and Somalian students. *Personality Study and Group Behaviour* , 8, 49-53.
- Kim, J. O., & Mueller, C. W. (1978). *Factor analysis: Statistical methods and practical issues* New Delhi: Sage Publications.
- Kline, R.B. (1998). *Principles and practice of structural equation modeling* (3rd ed., pp. 230–298.) New York: Guilford Press.
- Kluckhohn, C. (1951). Values and value-orientations in the theory of action: An exploration in definition and classification. In T. Parsons & E. Shils (Eds.), *Toward a general theory of action* (pp. 388-433). Cambridge, MA: Harvard University Press.
- Leiserowitz, A. A., Kates, R. W., & Parris, T. M. (2006). Sustainability values, attitudes, and behaviors: A review of multinational and global trends. *Annual Review of Environment and Resources* , 31 , 413-444.
- Maio, G. R. (2016). *The psychology of human values* . Routledge.
- Maslow, A. H. (1967). A theory of metamotivation: The biological rooting of the value-life. *Journal of Humanistic Psychology* , 7 (2), 93-127.
- McLeod, S. A. (2016). Id, ego and superego. *Simply Psychology* , 3 , 1-4.
- Morris, C. W. (1956). *Varieties of human value*. Chicago, IL: University of Chicago Press.
- Renner, W. (2003). Human values: A lexical perspective. *Personality and Individual Differences* , 34 (1), 127-141.
- Rohan, M. J. (2000). A rose by any name? The values construct. *Personality and Social Psychology Review* , 4 (3), 255-277.
- Rokeach, M. (1967). *Value Survey* , Halgren, Tests, Sunnyvale, CA.
- Rokeach, M. (1973). *The nature of human values* . New York: Free press.
- Rokeach, M. (1979). *Understanding human values* . New York: Free Press.
- Rokeach, M. (2008). *Understanding human values* . Simon and Schuster.
- Sagiv, L., Roccas, S., Cieciuch, J., & Schwartz, S. H. (2017). Personal values in human life. *Nature Human Behaviour* , 1 (9), 630.
- Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online readings in Psychology and Culture* , 2 (1), 11.
- Shepherd, D. A., Kuskova, V., & Patzelt, H. (2009). Measuring the values that underlie sustainable development: The development of a valid scale. *Journal of Economic Psychology* , 30 (2), 246-256.
- Sheth, N. R. (1995). Values in search of an identity. *Journal of Human Values* , 1 (1), 75-91.

- Stevens, J. (2002). *Applied Multivariate Statistics for the Social Sciences (4th Edition)*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Toffler, A. (1969). Value Impact Forecaster—A Profession of the Future. *Values and the Future* , 4.
- Vernon, P. E., & Allport, G. W. (1931). A test for personal values. *The Journal of Abnormal and Social Psychology* , 26 (3), 231-248.
- Williams Jr, R.M. (1979). Change and stability in values and value systems: A sociological perspective. *Understanding human values*, 15 , 46.